

Figure 1 A

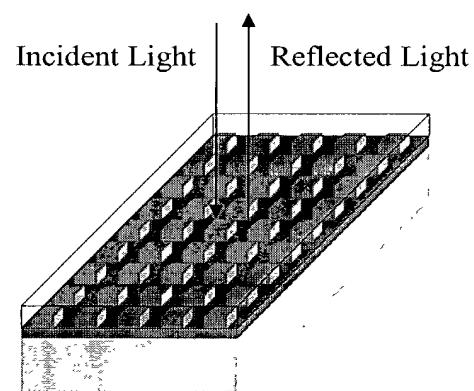


Figure 1 B

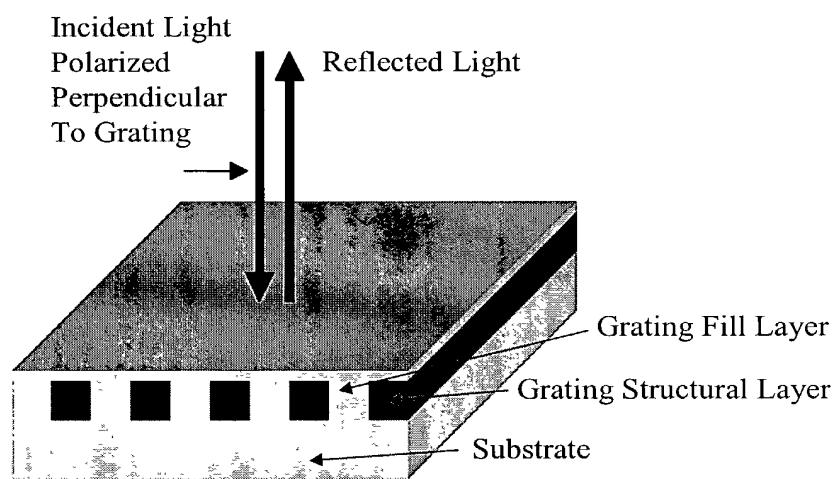


Figure 2

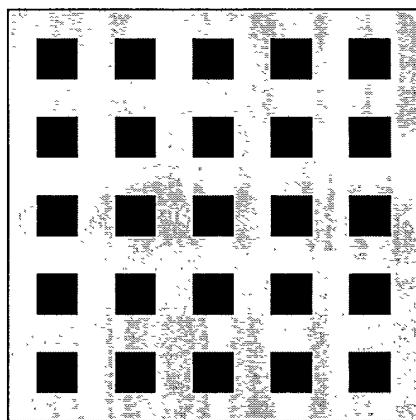


Figure 3A

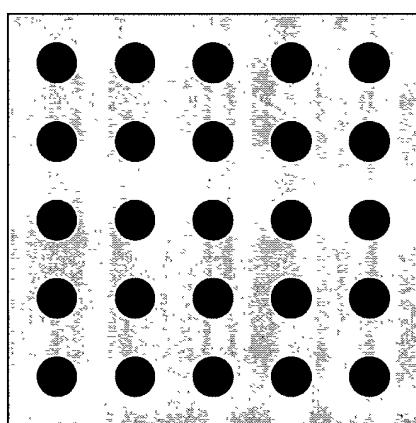


Figure 3B

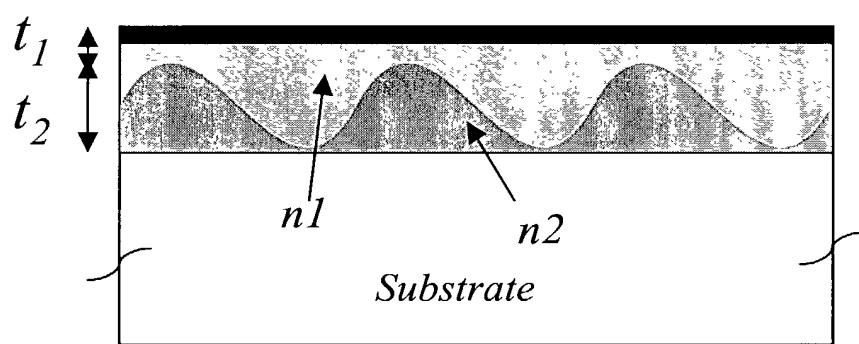


Figure 4

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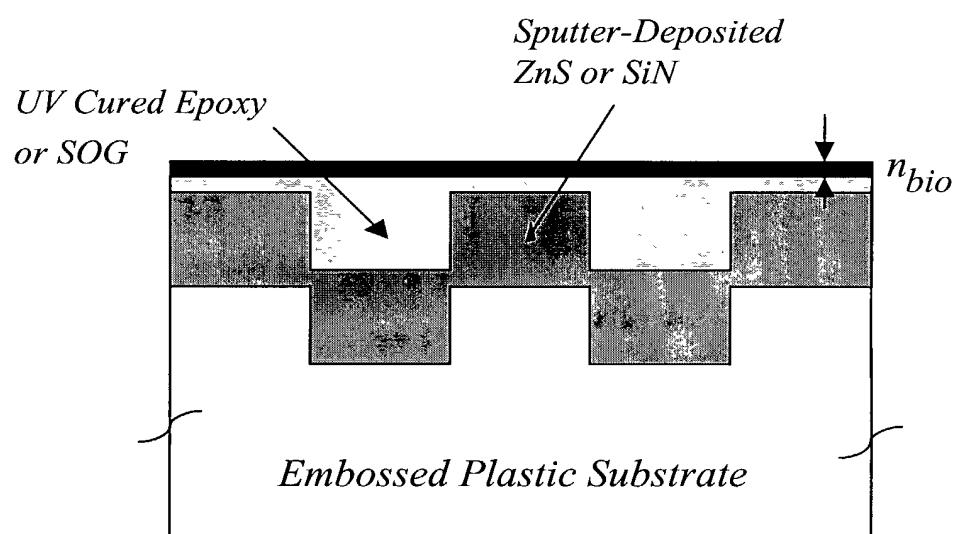


Figure 5

Amine	<ul style="list-style-type: none"> ➤ Sulfo-succinimidyl-6-(biotinamido)hexanoate (Sulfo-NHS-LC-Biotin) <ul style="list-style-type: none"> • Streptavidin / avidin then biotinylated molecule ➤ N,N'-disuccinimidyl carbonate (DSC); • -NH₂, non-cleavable ➤ Dimethyl pimelimidate (DMP); • -NH₂, non-cleavable ➤ Dimethyl 3,3'-dithiobispropionimidate (DTBP); • -NH₂, cleavable ➤ 1-Ethyl-3-(3-Dimethylaminopropyl)carbodiimide Hydrochloride (EDC) and N-Hydroxysulfosuccinimide (Sulfo-NHS); • -COOH ➤ Sulfo-succinimidyl 6-[a-methyl-a-(2-pyridyl-dithio)toluamido] hexanoate (Sulfo-LC-SMPT); • -SH, cleavable ➤ N-(B-Maleimidopropoxy)succinimide ester (BMPS) <ul style="list-style-type: none"> • -SH₂, non-cleavable ➤ Sulfo-succinimidyl 4-[N-maleimidomethyl)cyclohexane-1-carboxylate (Sulfo-SMCC); • -SH, non-cleavable
Aldehyde	<ul style="list-style-type: none"> ➤ Directly with aldehyde or first amino then aldehyde <ul style="list-style-type: none"> • -NH₂
Ni(II)	<ul style="list-style-type: none"> ➤ Using Nitrilotriacetic acid (NTA) group, which forms a chelate with Ni(II) <ul style="list-style-type: none"> • His-tagged molecules

Figure 6



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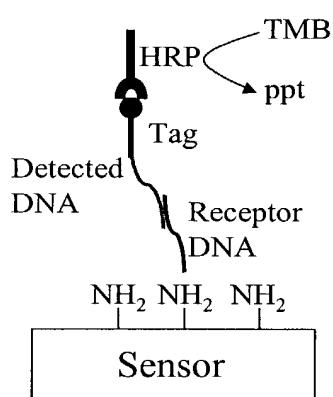


Figure 7A

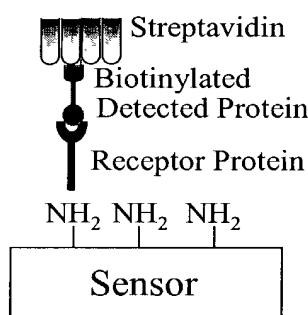


Figure 7B

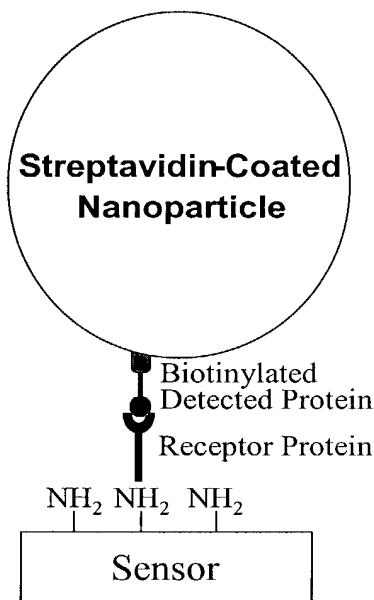


Figure 7C



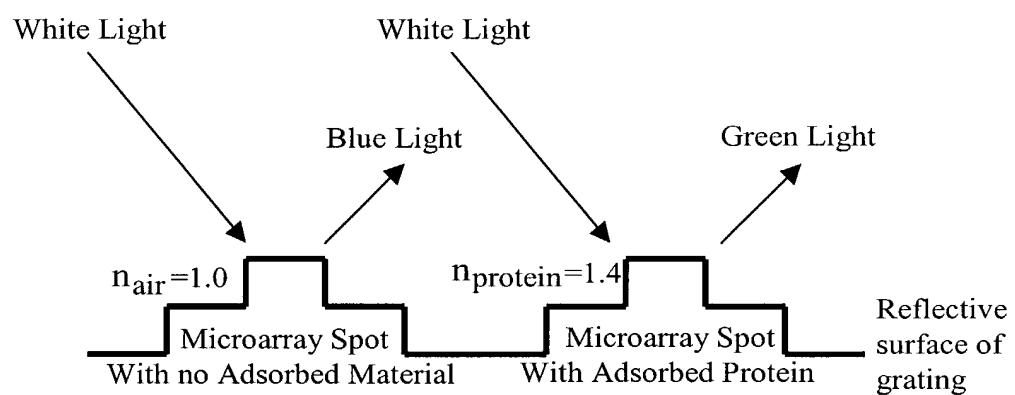


Figure 8

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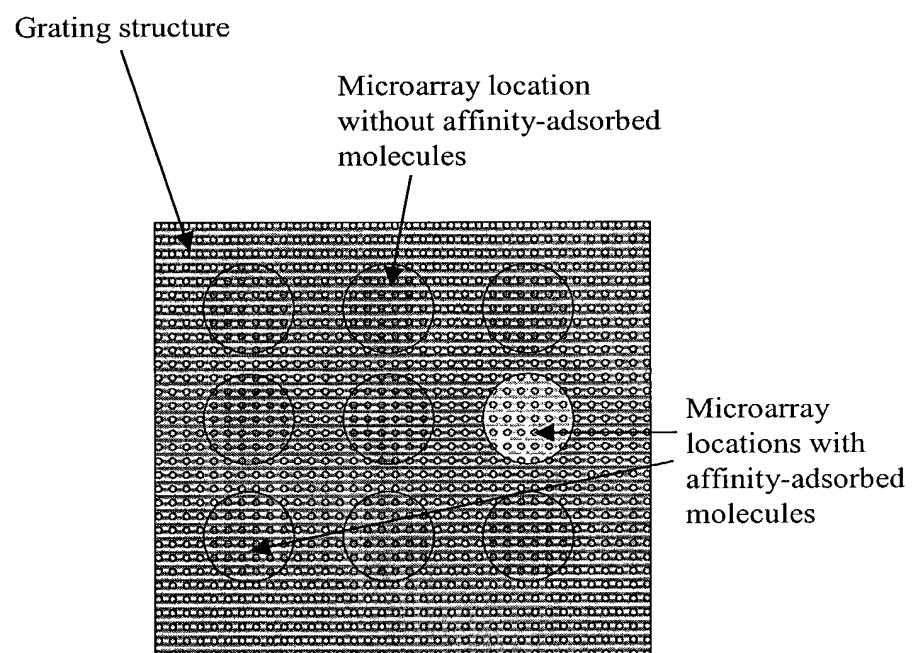


Figure 9

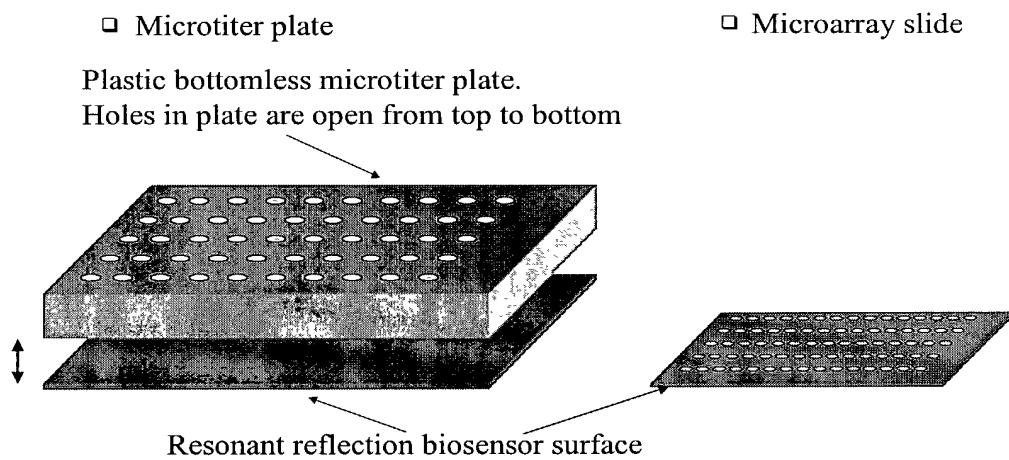
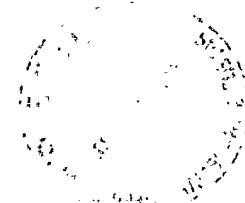


Figure 10A

Figure 10B



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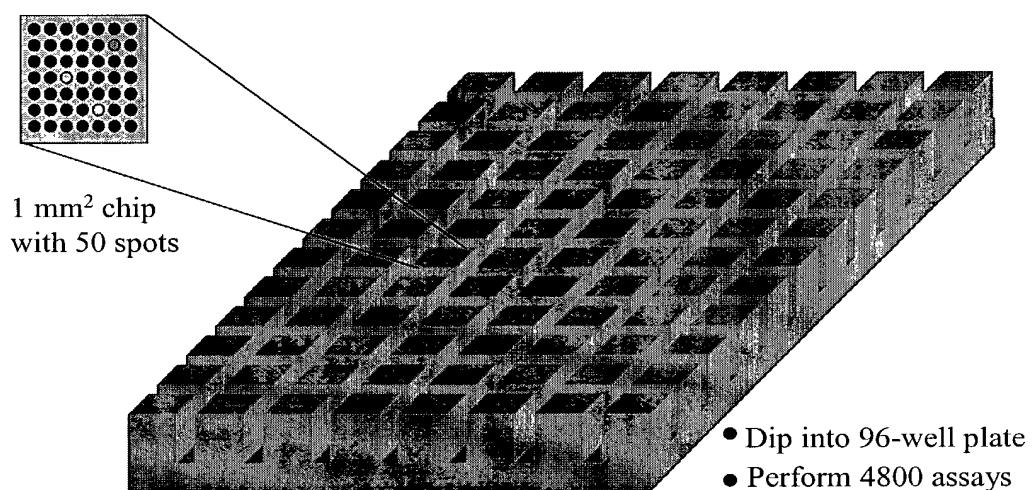


Figure 11



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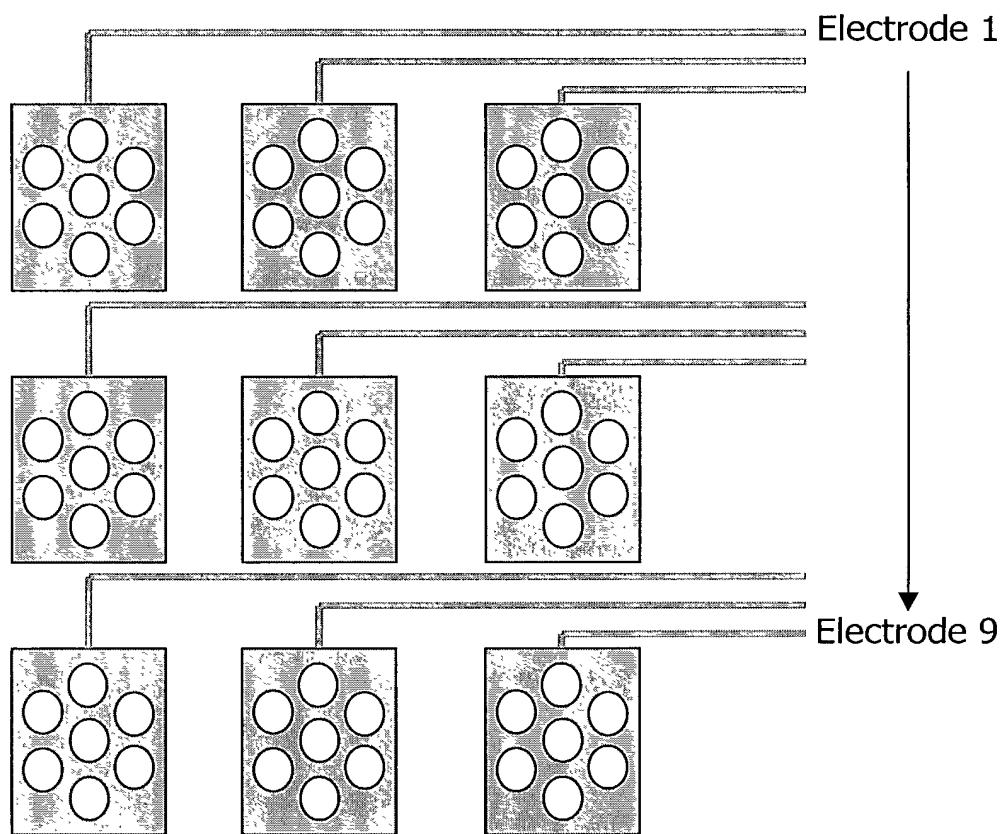
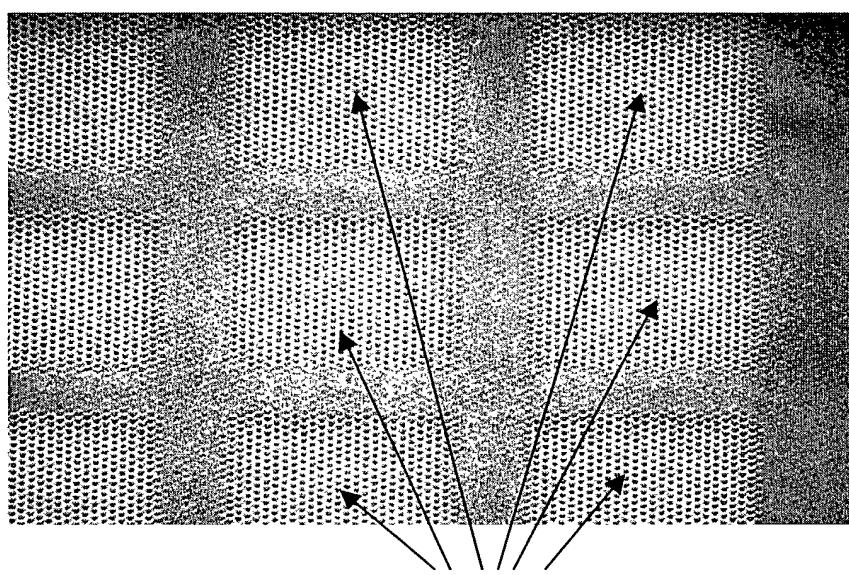


Figure 12

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Separate electrode grating regions

Figure 13



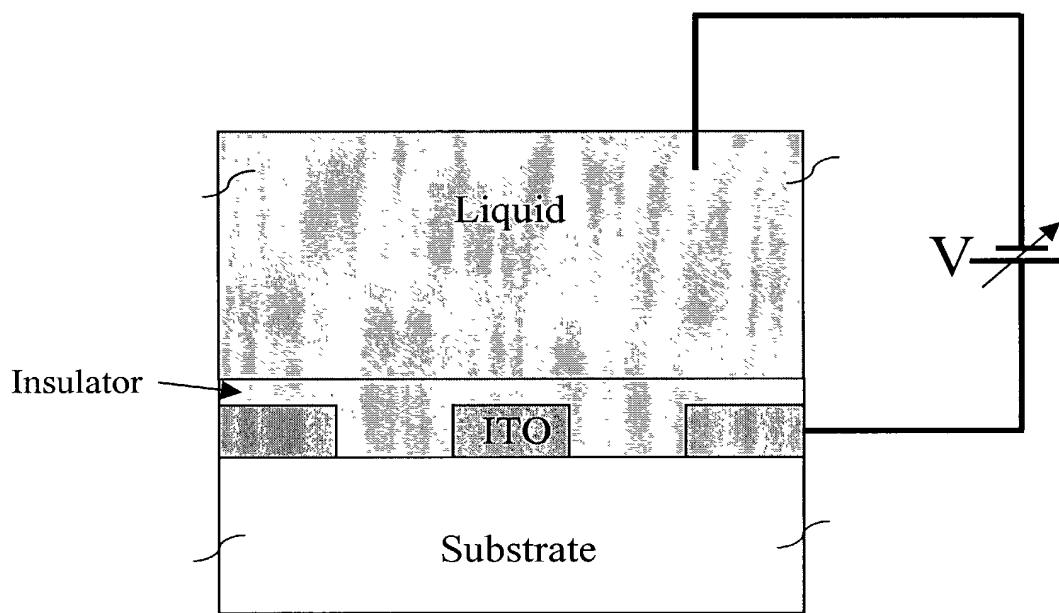


Figure 14

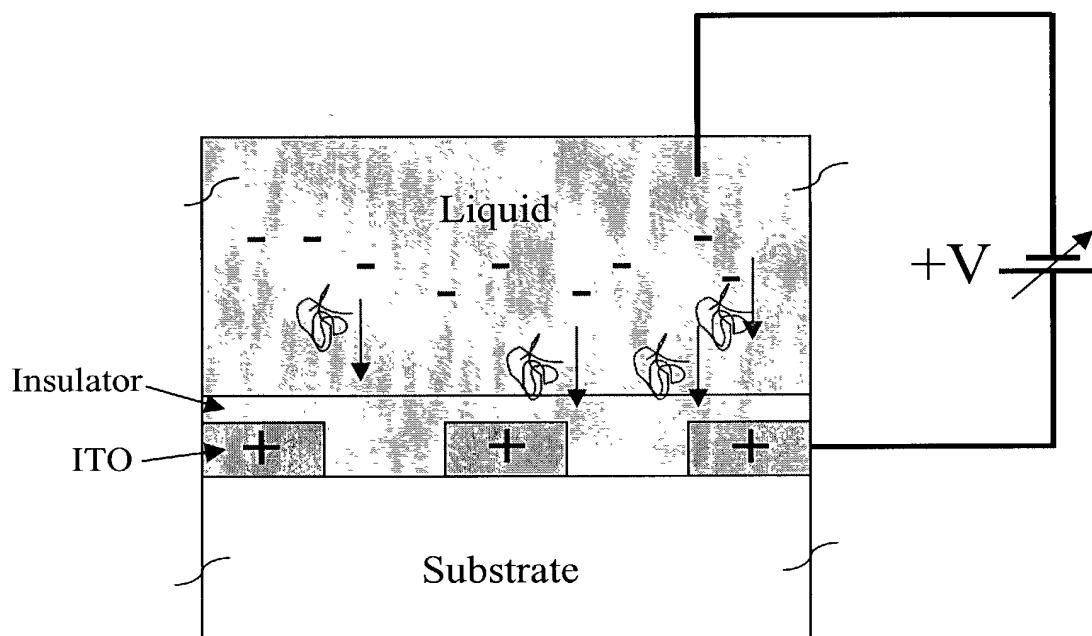


Figure 15

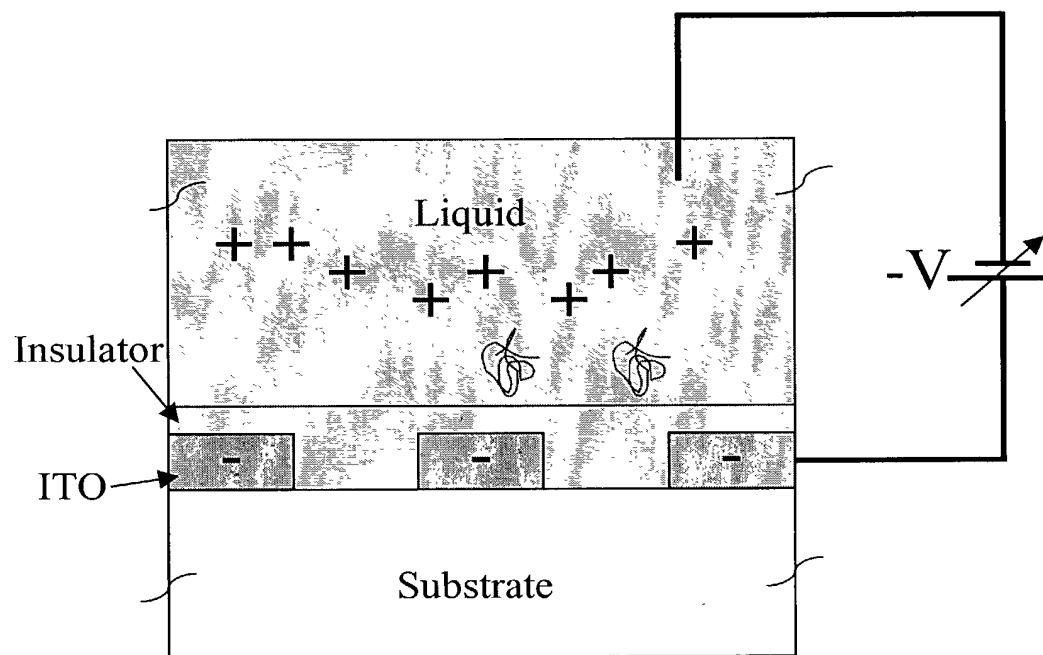


Figure 16

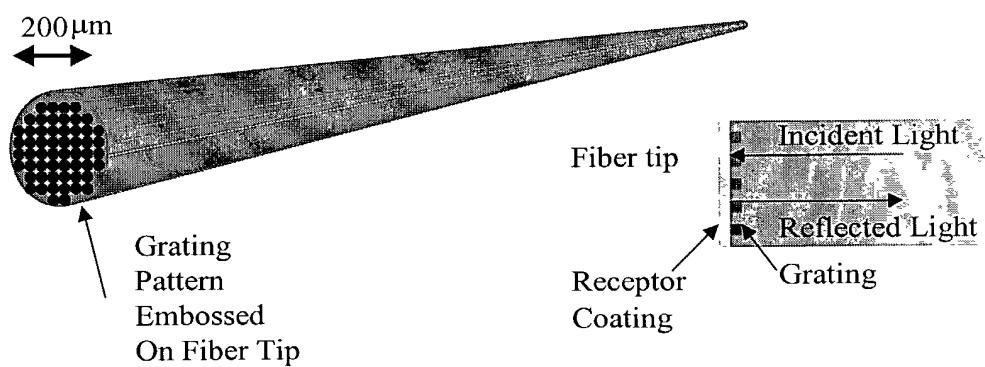


Figure 17

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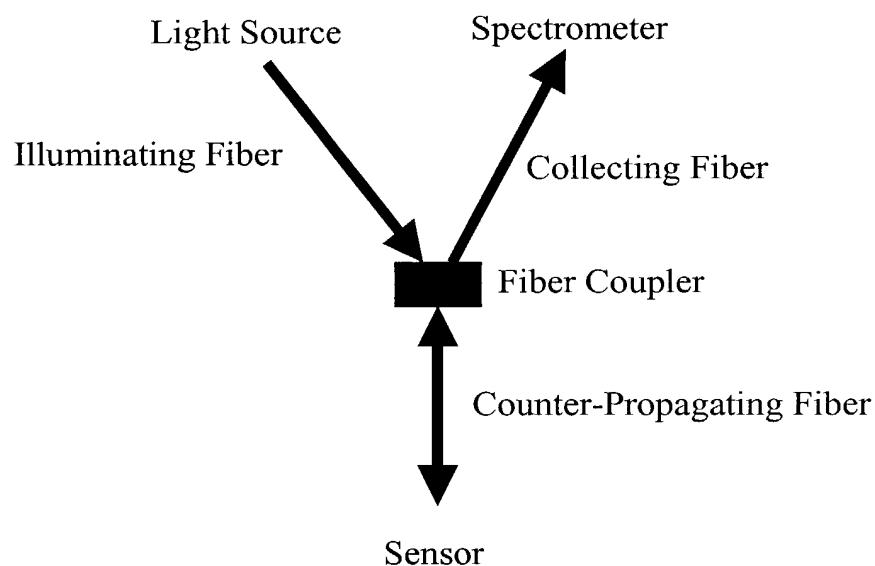


Figure 18



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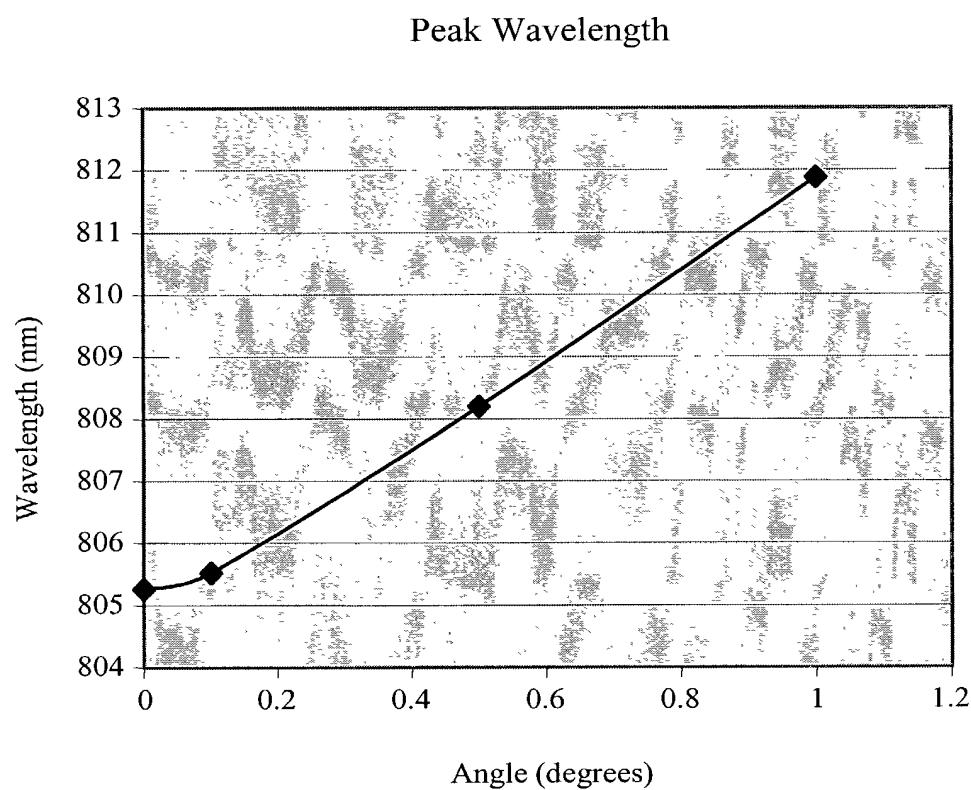


Figure 19

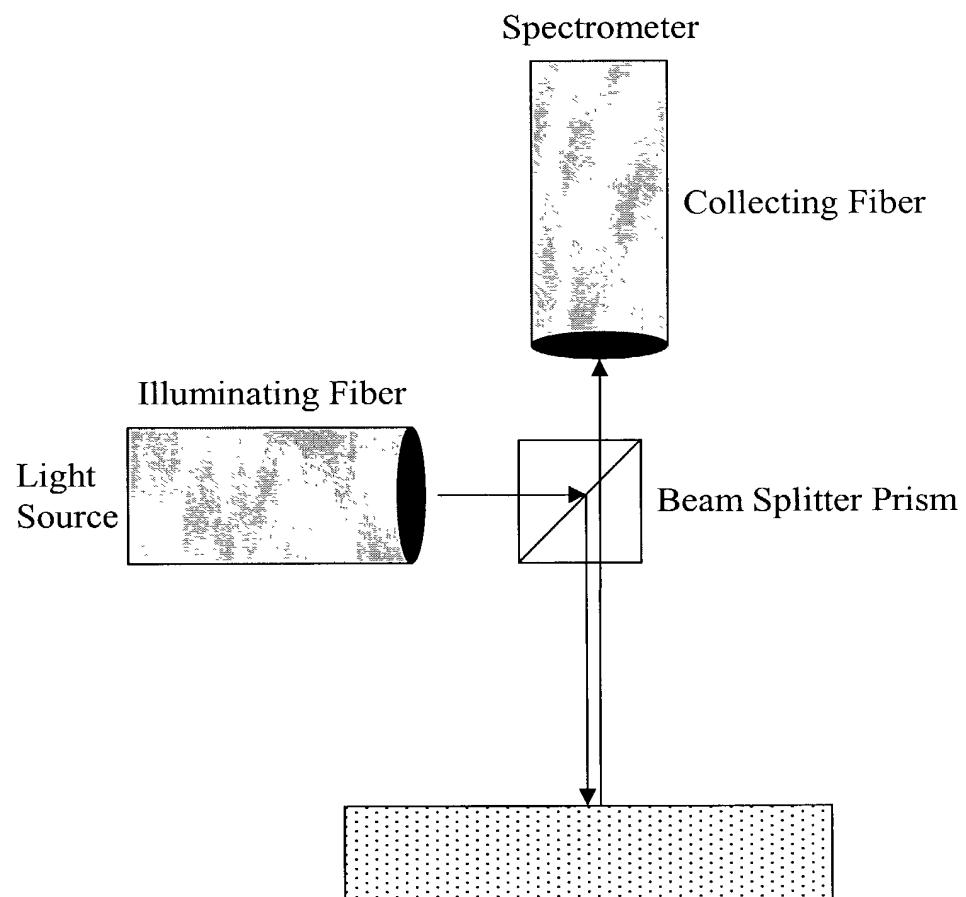


Figure 20

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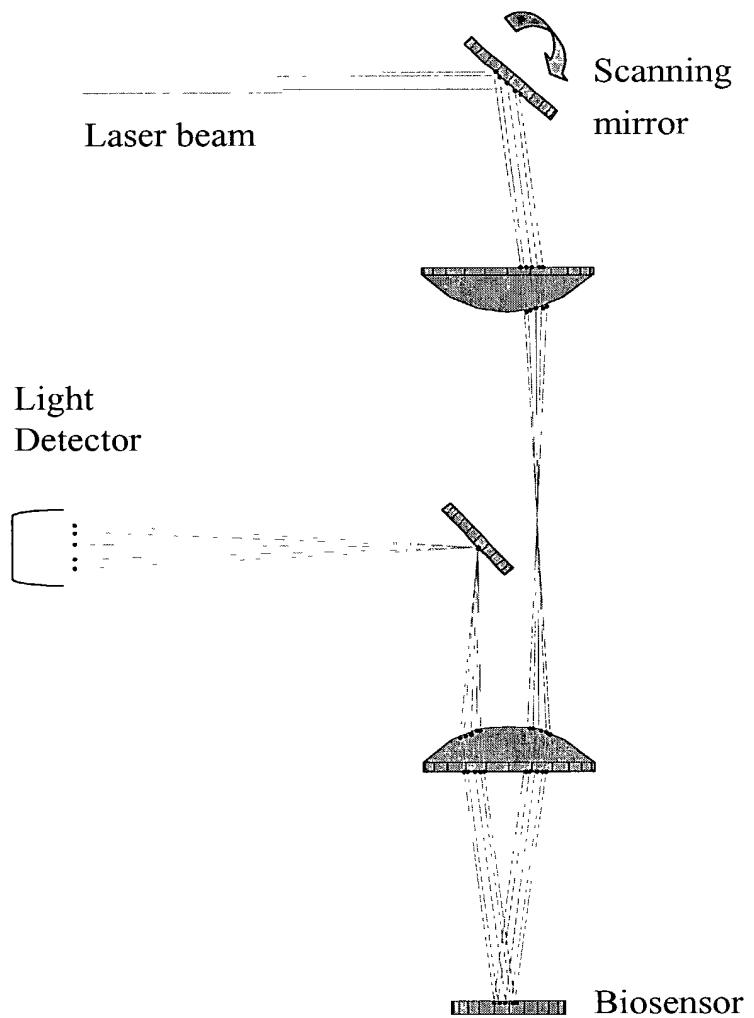


Figure 21



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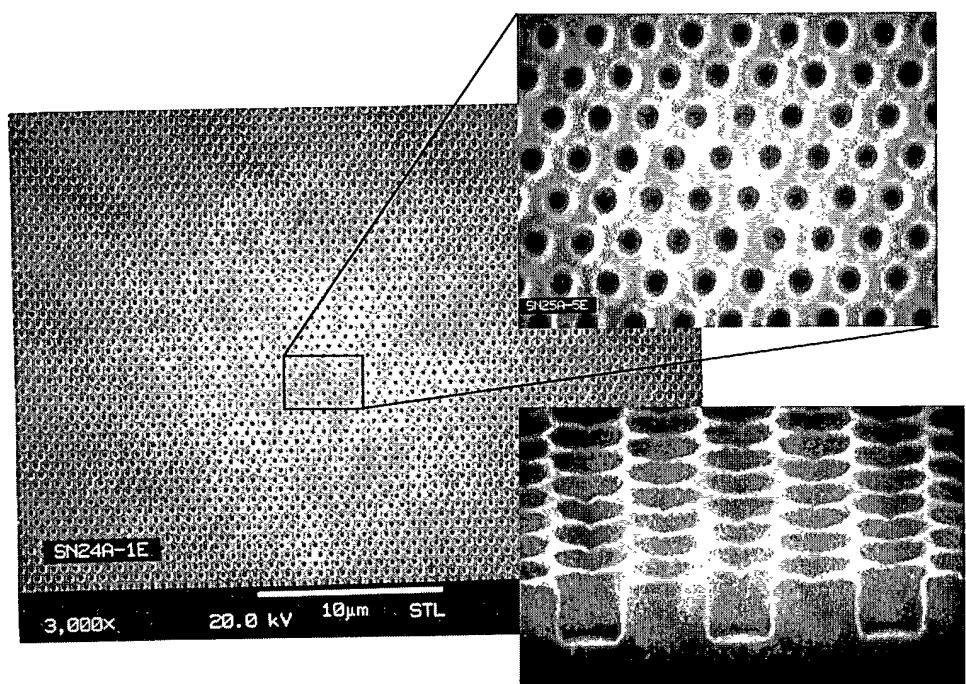


Figure 22

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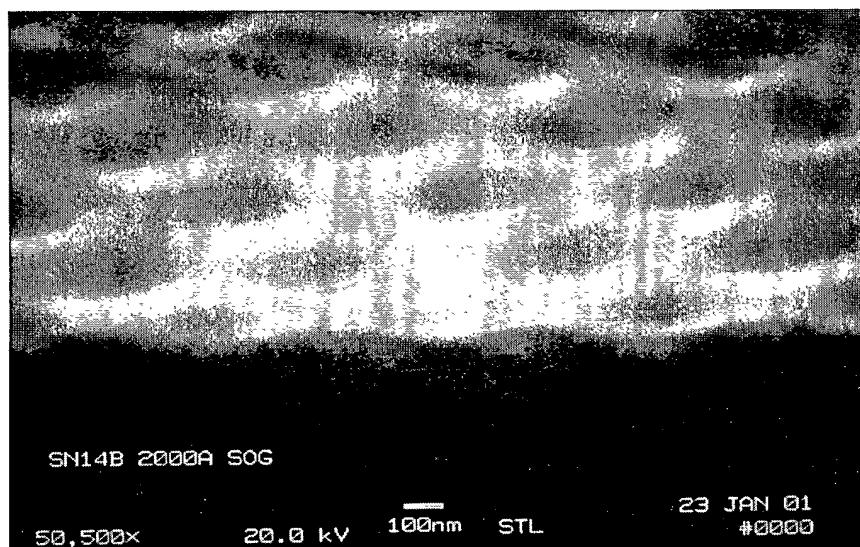


Figure 23

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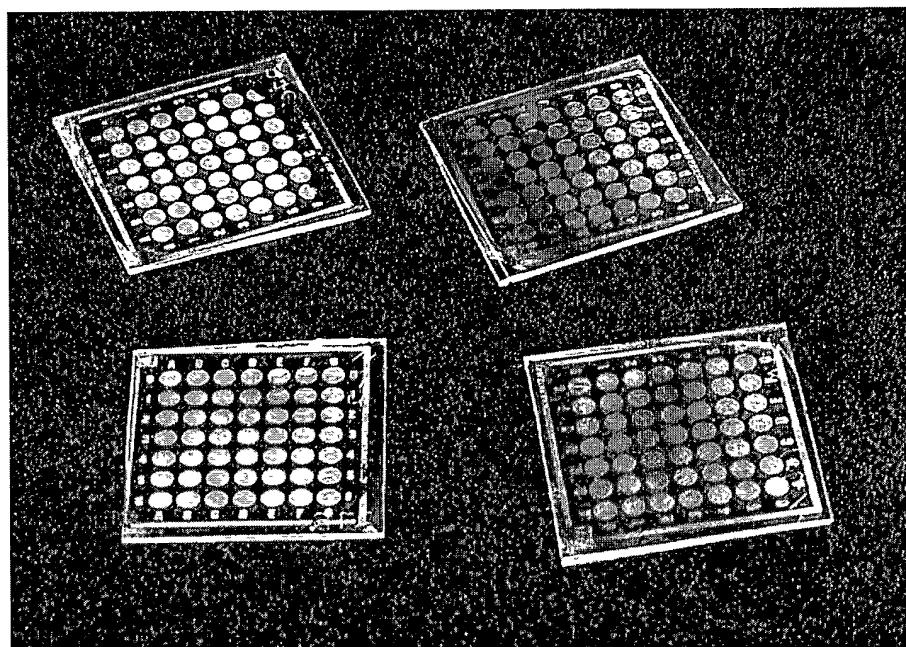
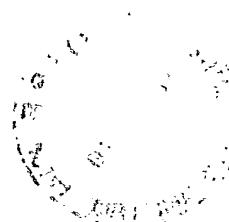


Figure 24



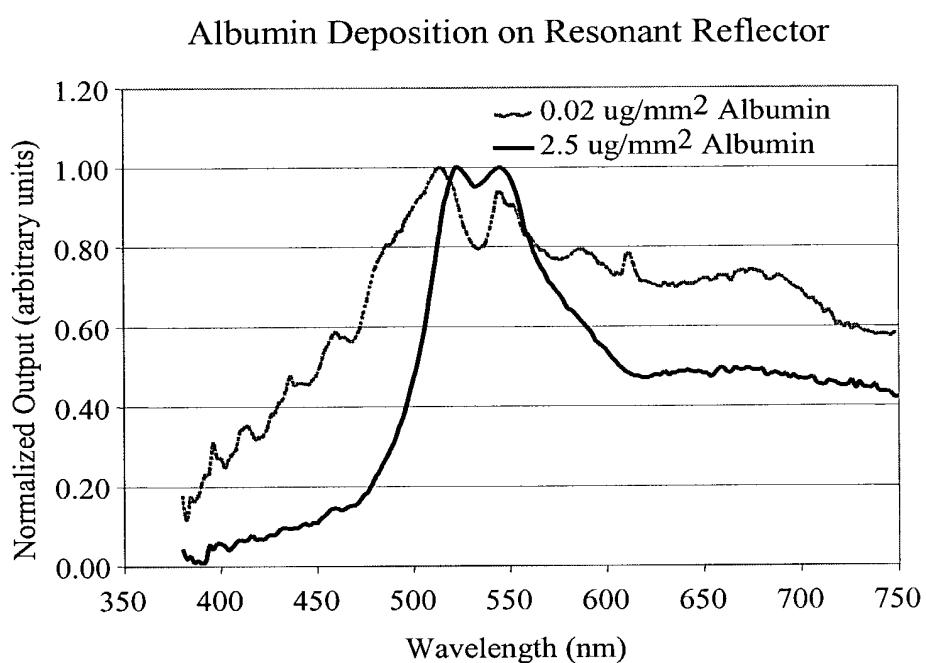


Figure 25

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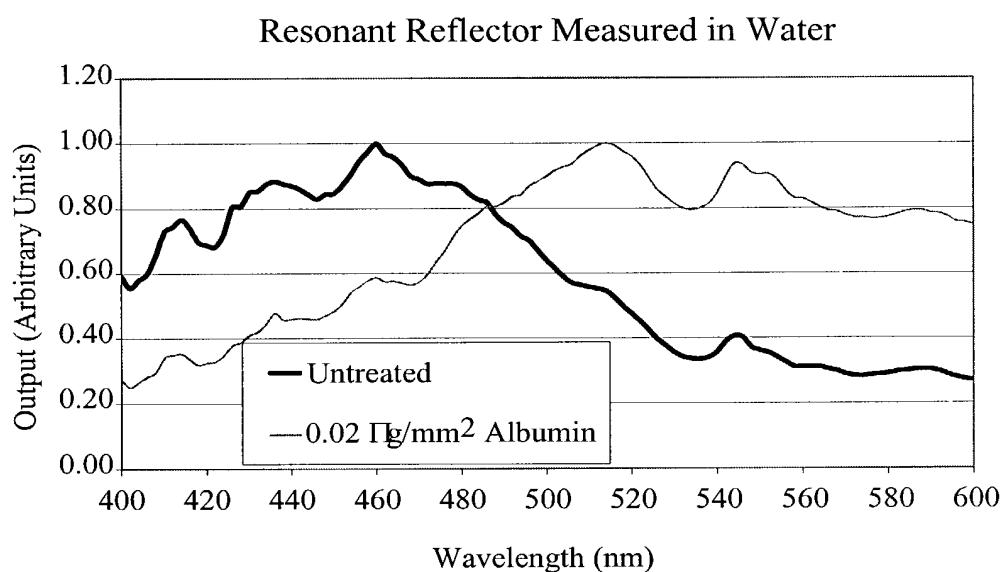


Figure 26

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Bacteria immobilization on structure

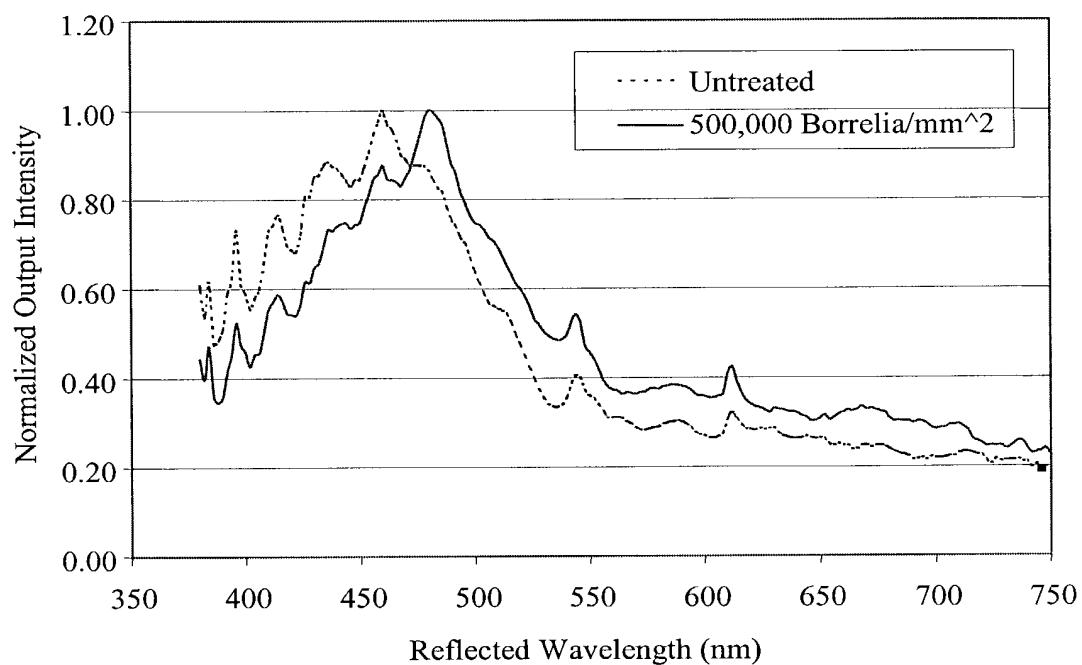


Figure 27

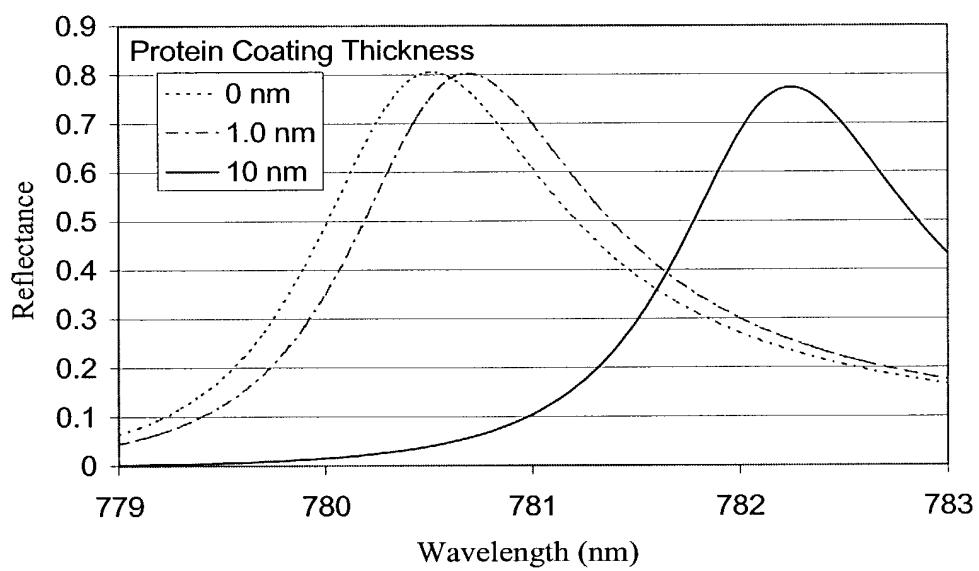


Figure 28

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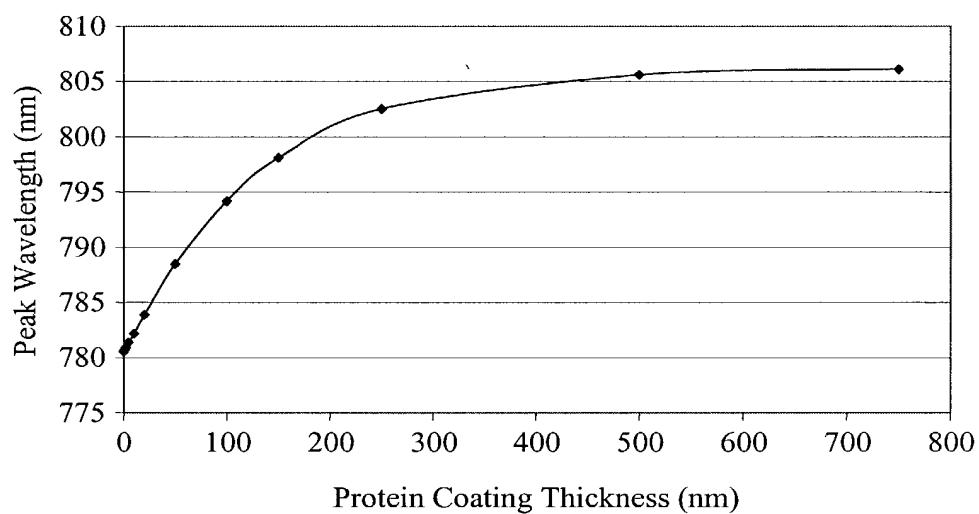


Figure 29

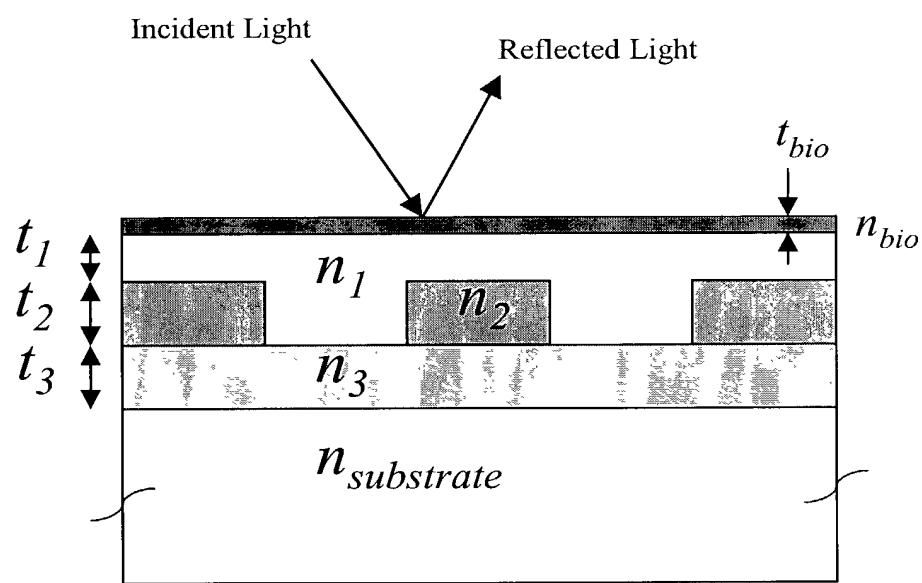


Figure 30

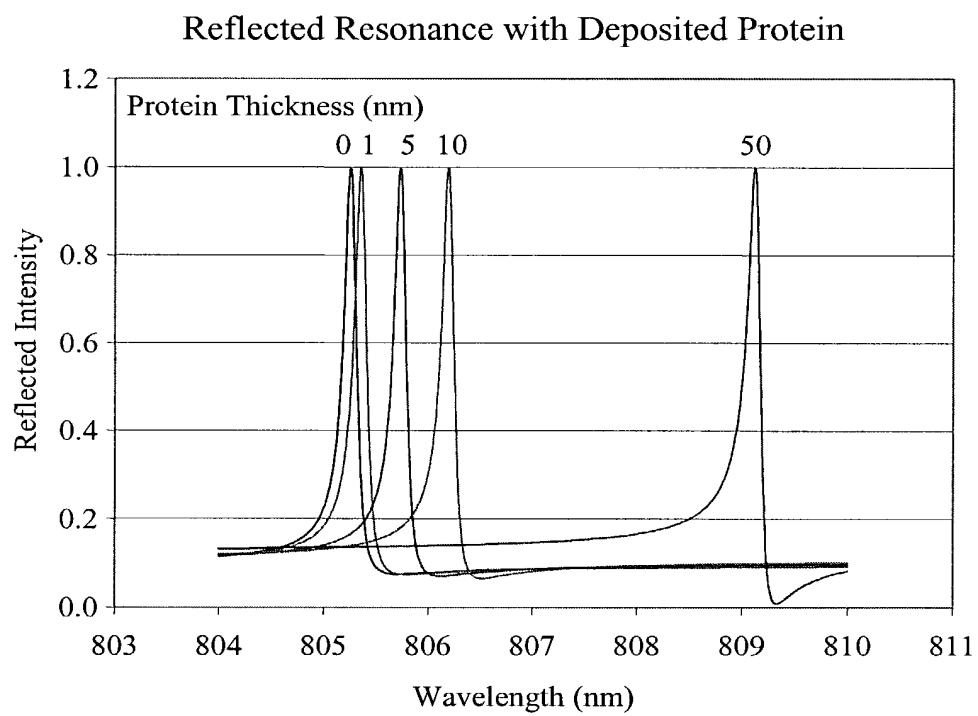


Figure 31

Resonant Peak Wavelength Dependence
on Deposited Protein Thickness

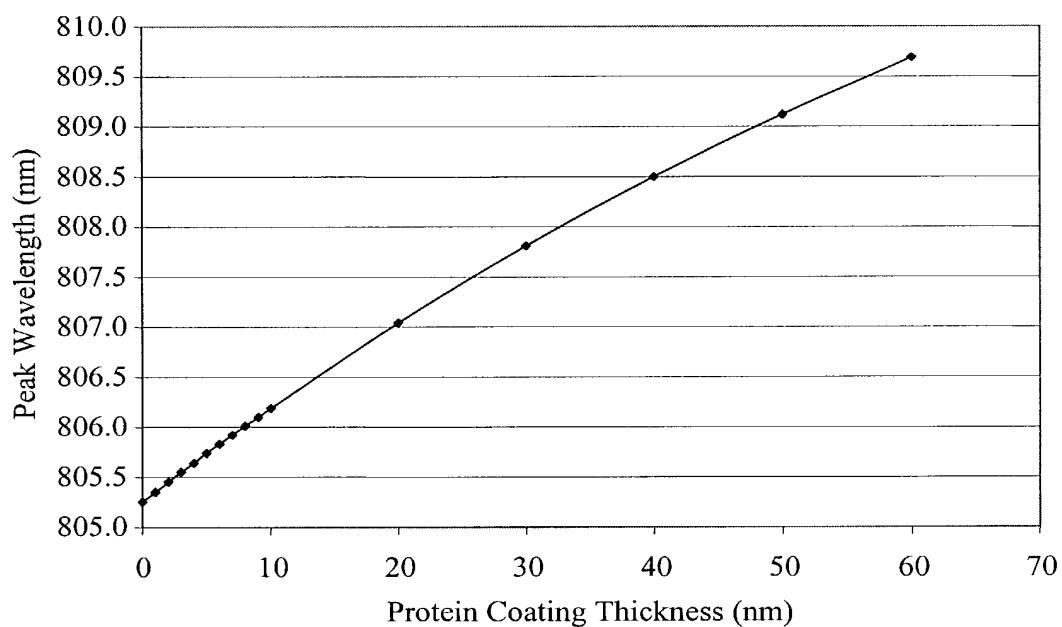


Figure 32

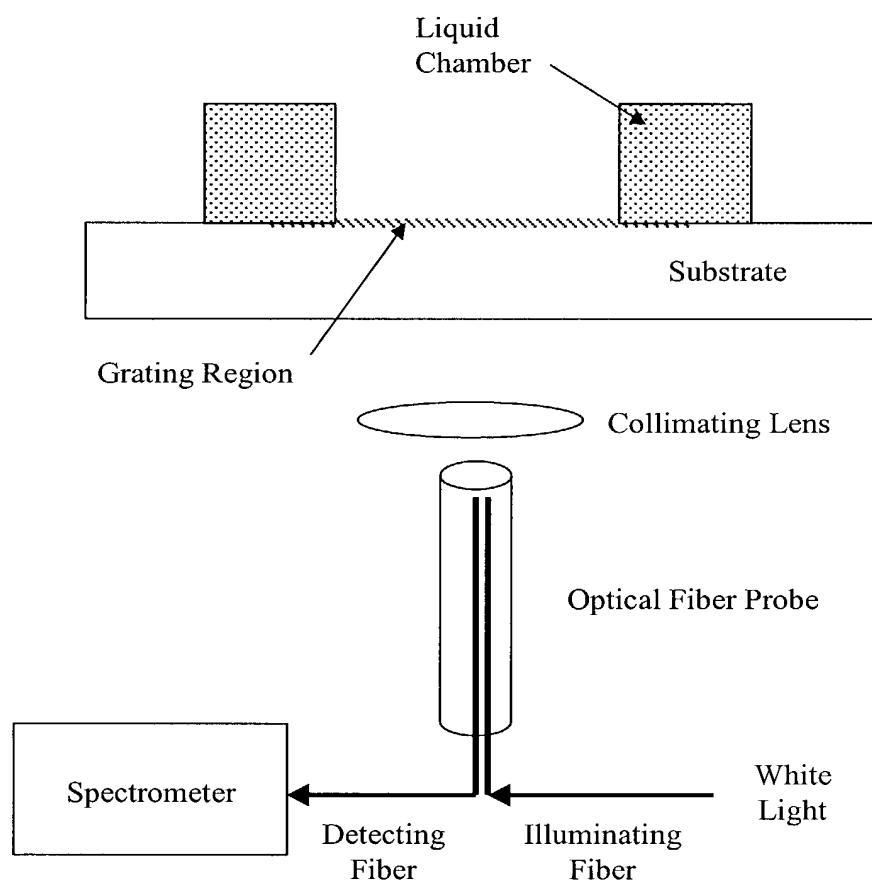


Figure 33



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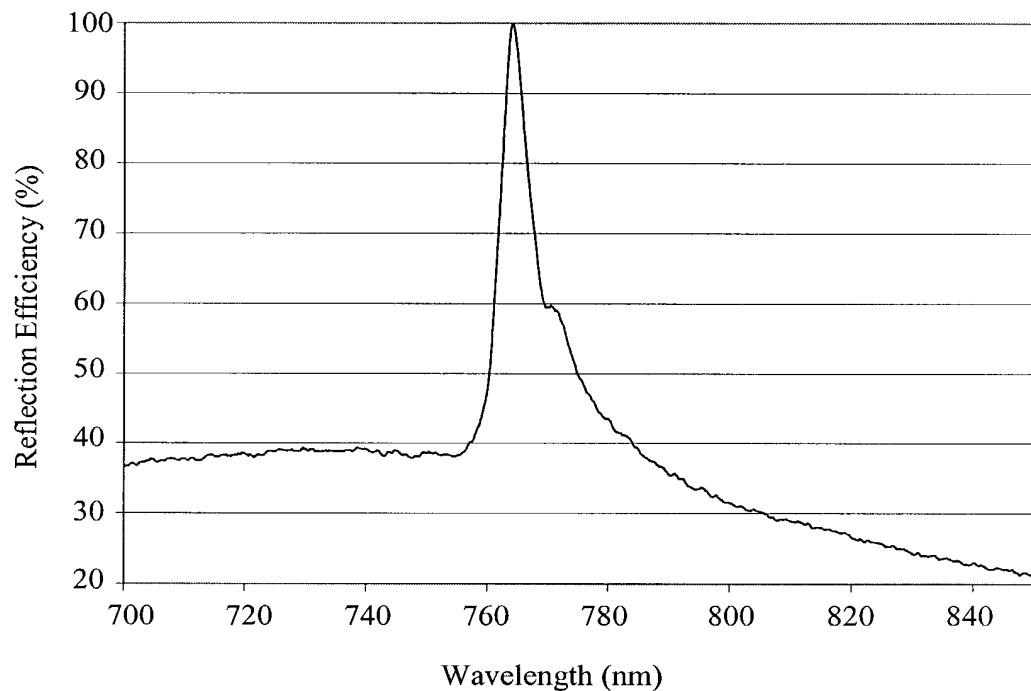


Figure 34



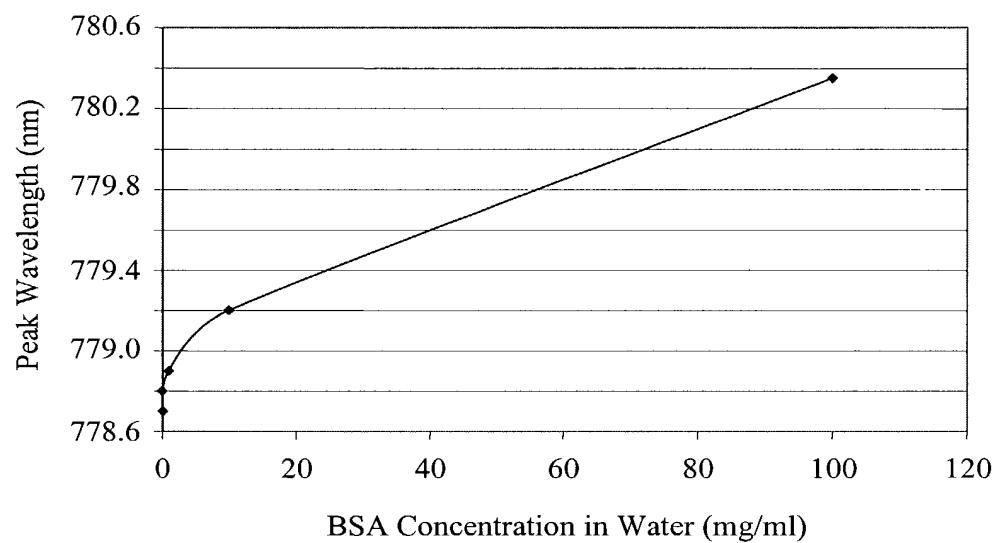


Figure 35

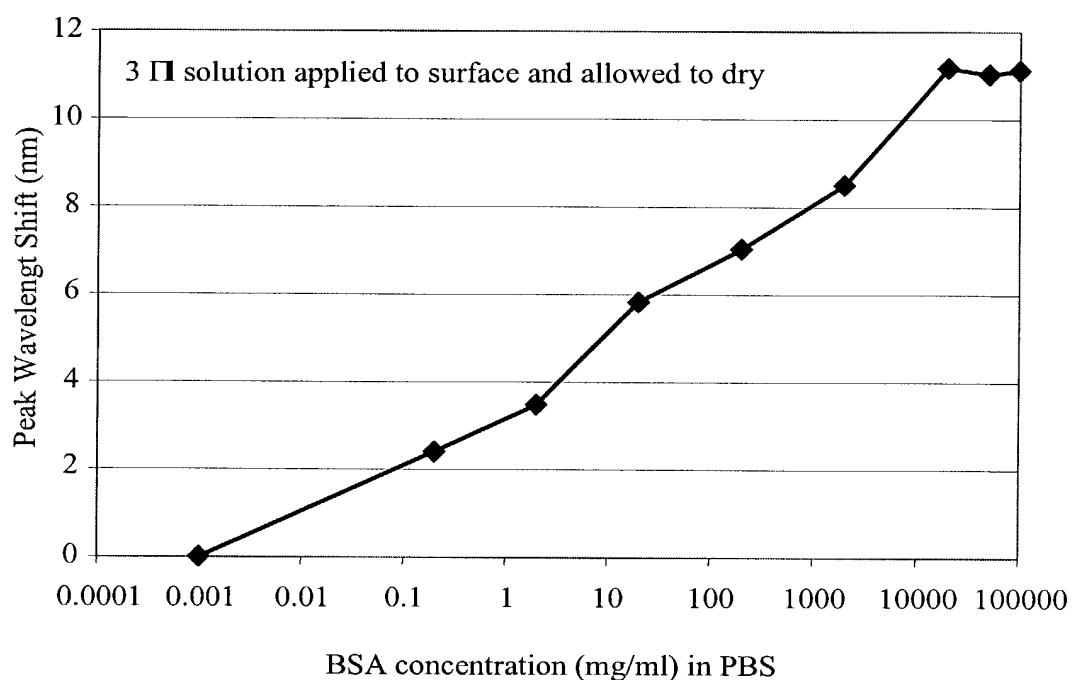


Figure 36

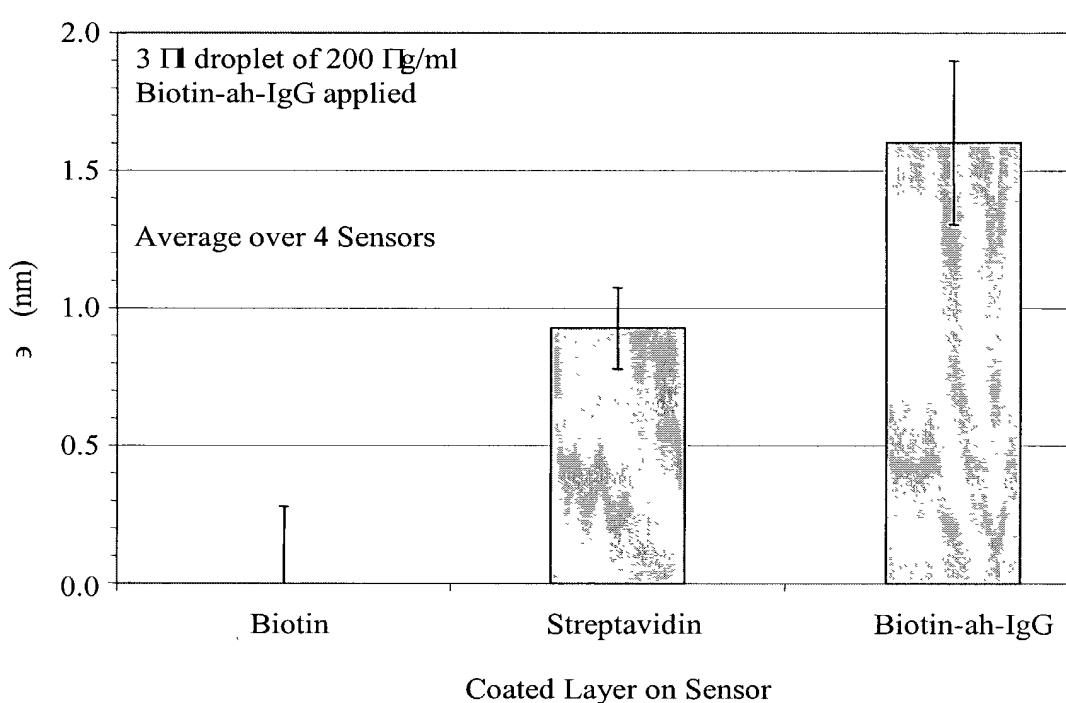


Figure 37A

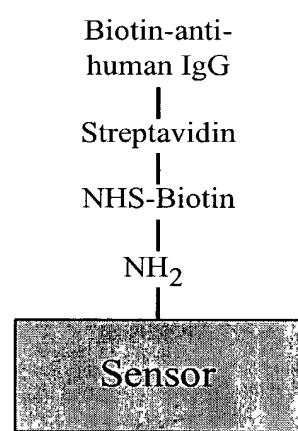


Figure 37B

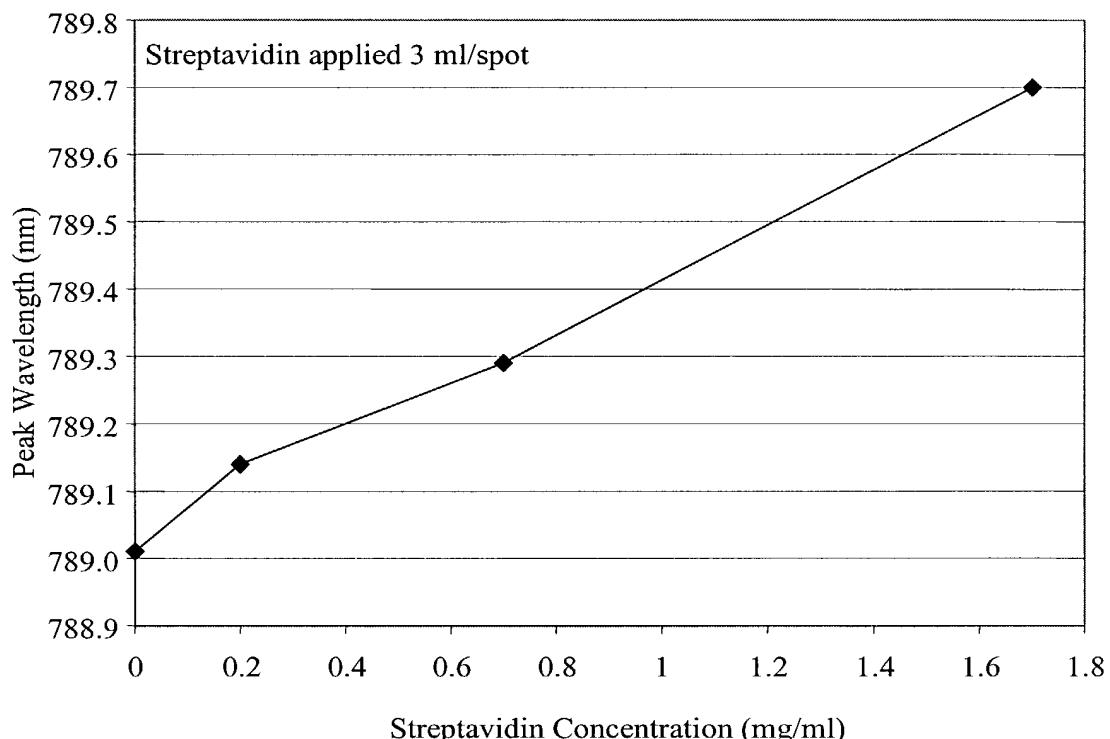


Figure 38A

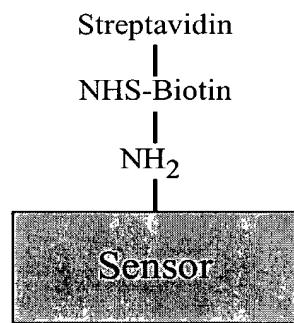


Figure 38B

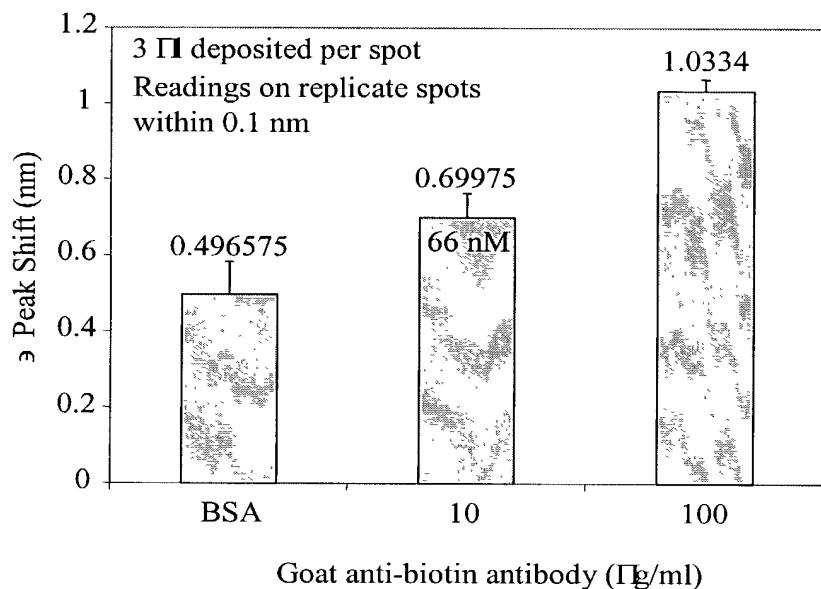


Figure 39A

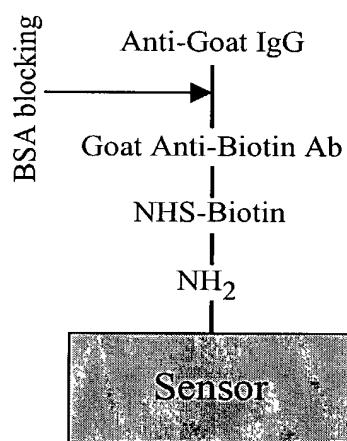


Figure 39B

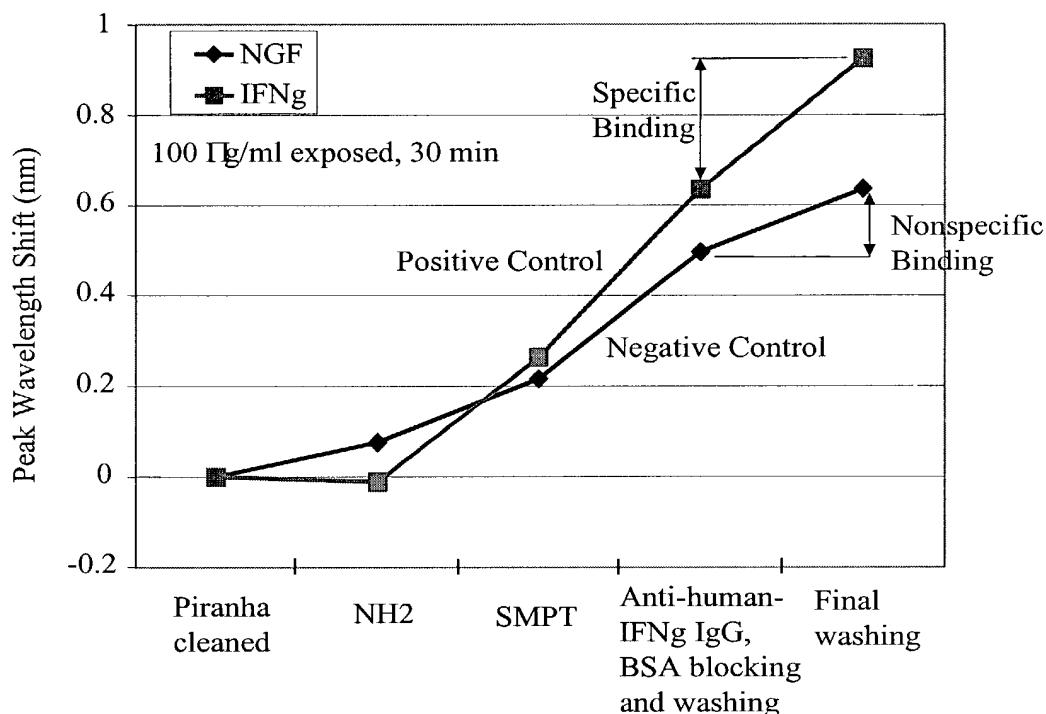


Figure 40A

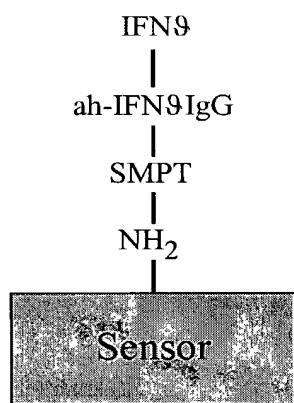


Figure 40B

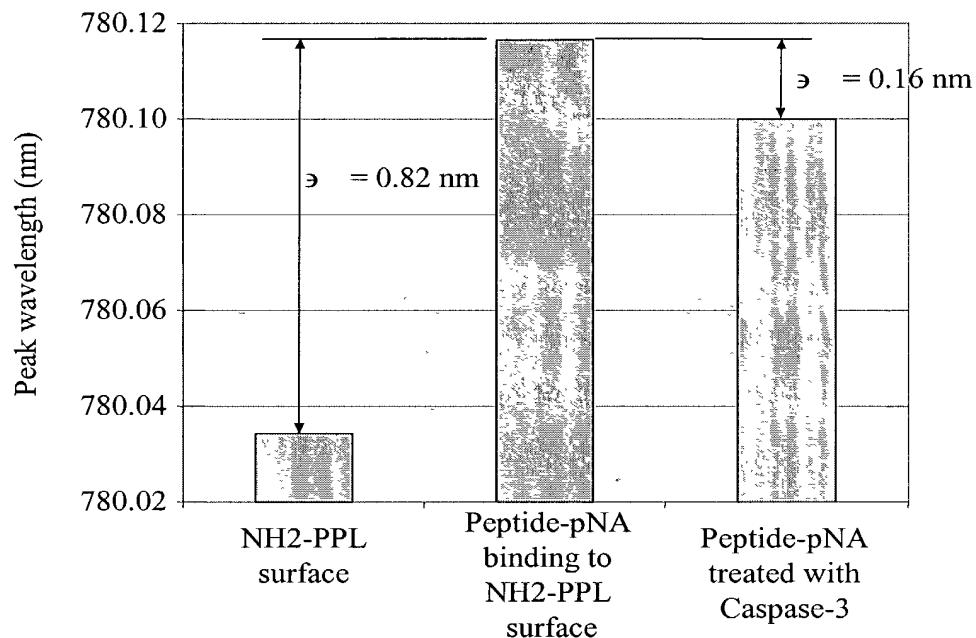


Figure 41A

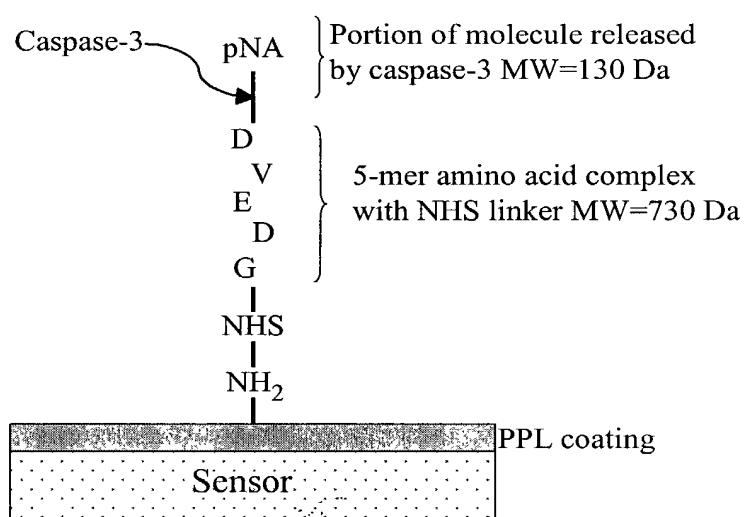


Figure 41B

Measured shifting of the resonant wavelength caused by the binding of various biomolecular layers.

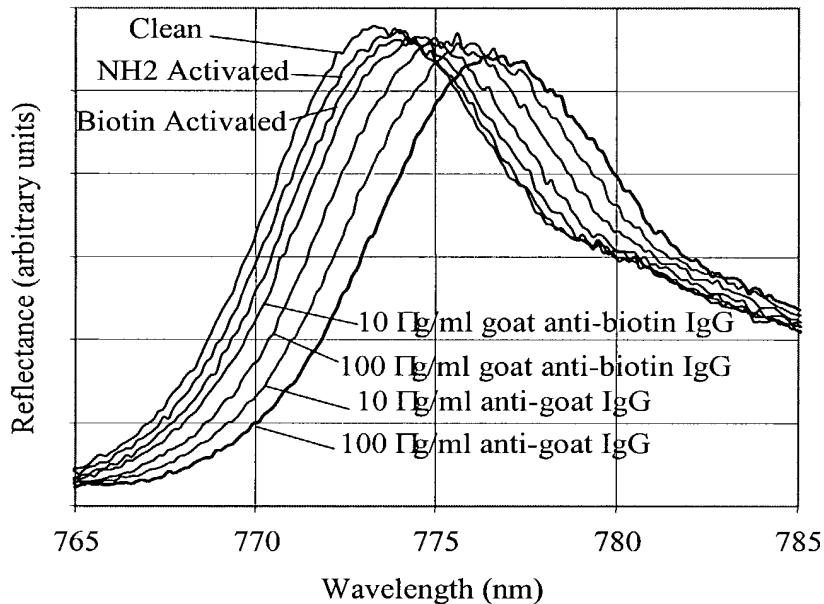


Figure 42A

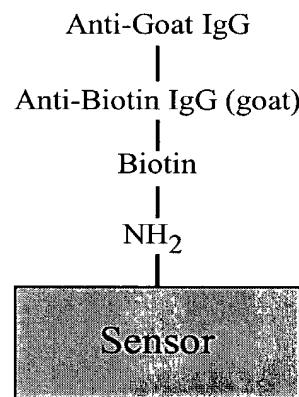


Figure 42B

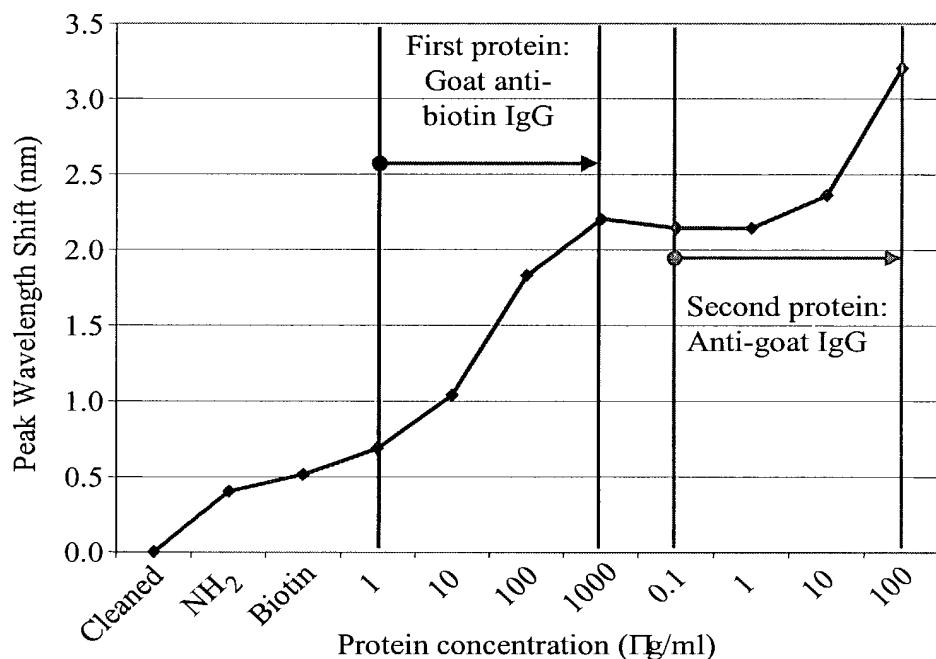


Figure 43A

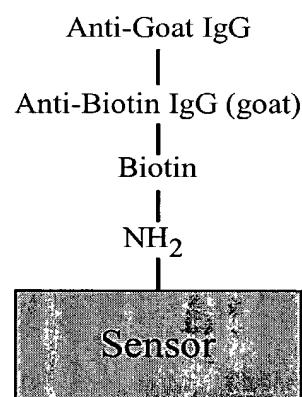


Figure 43B

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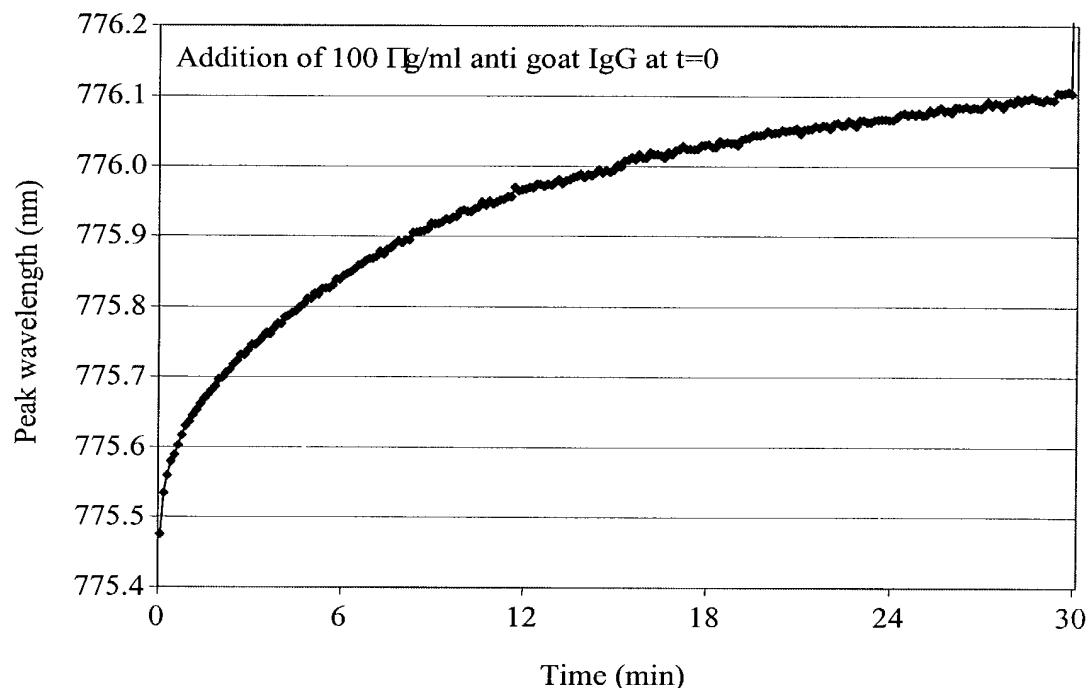


Figure 44A

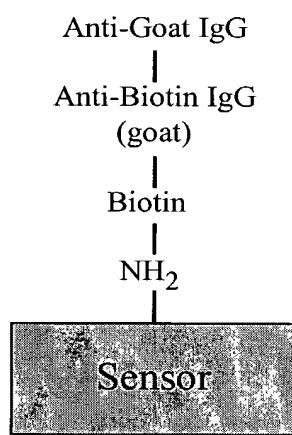


Figure 44B

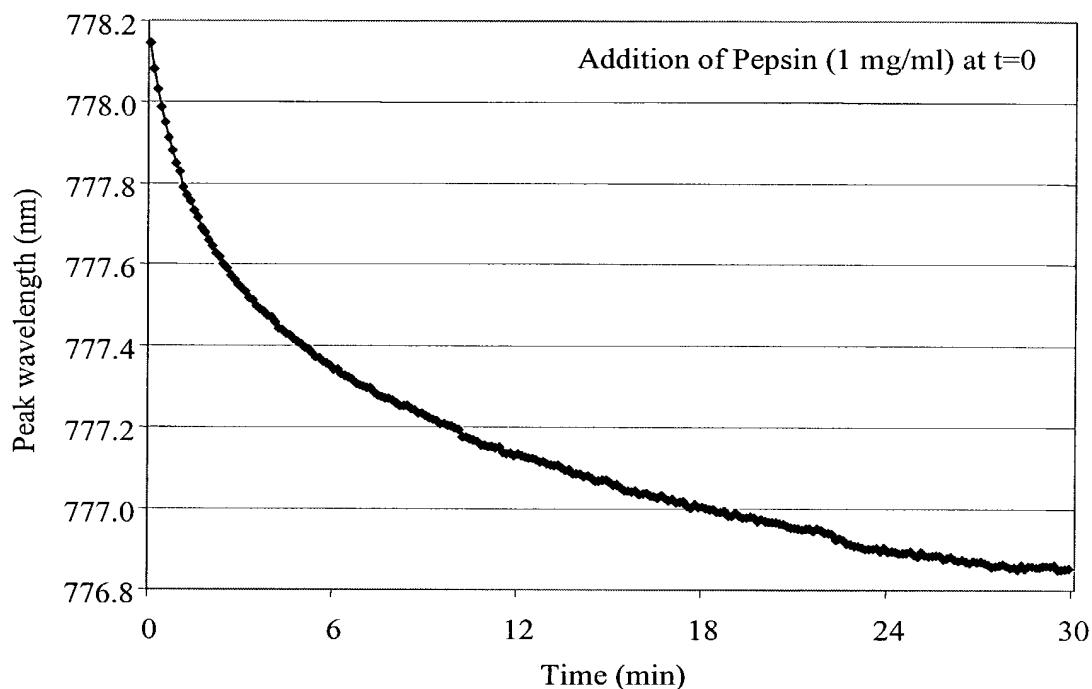
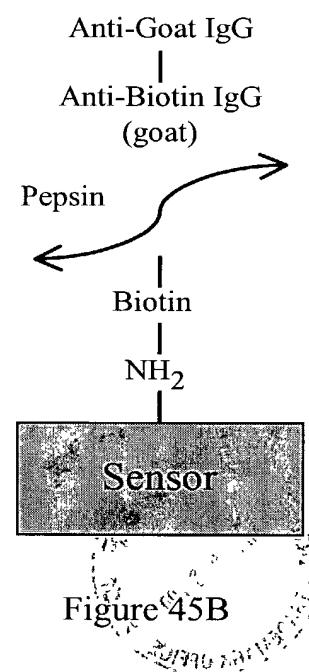


Figure 45A



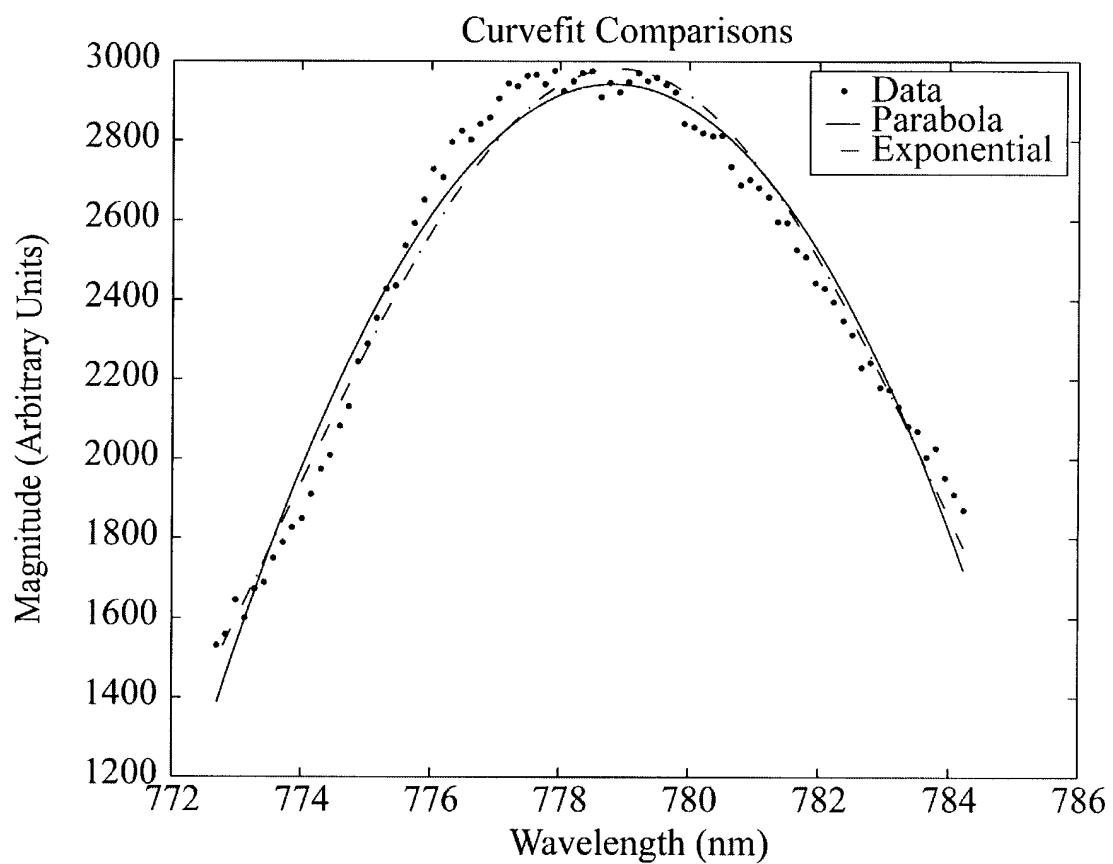


Figure 46

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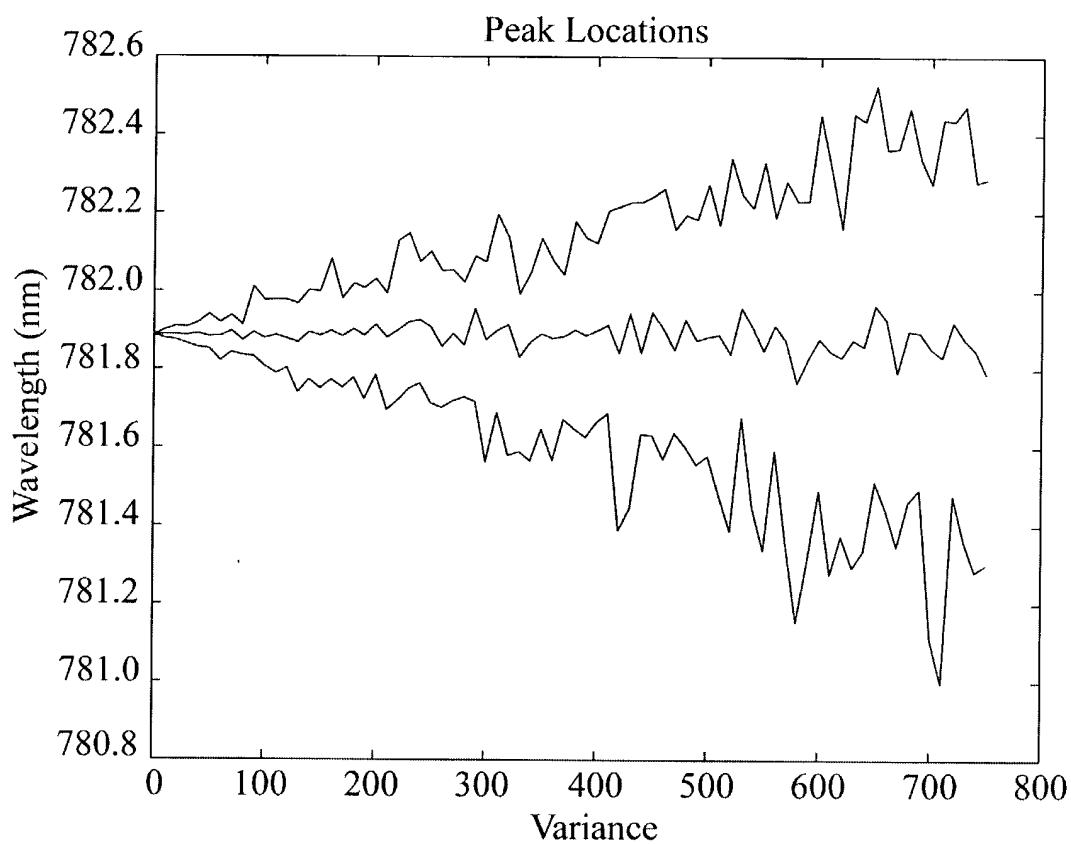
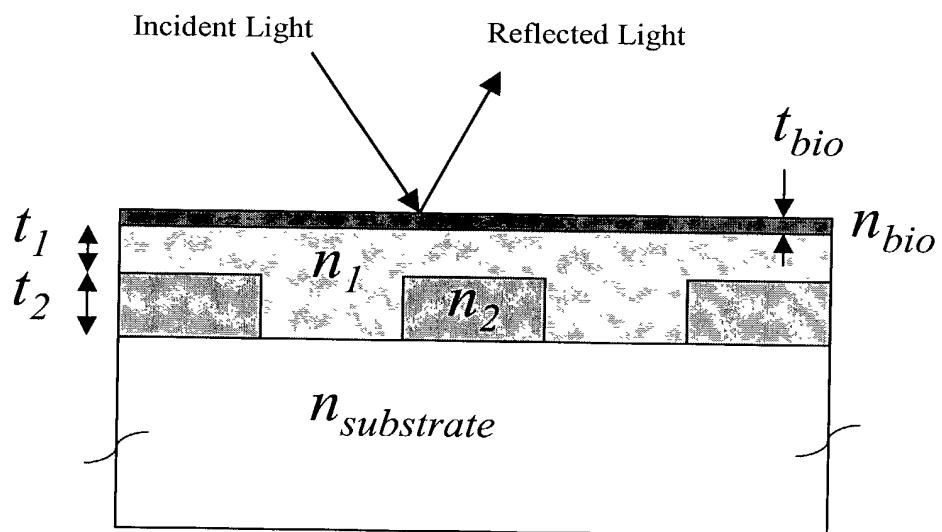


Figure 47



Material 1 = Electrical Insulator (photoresist, epoxy, glass)
Material 2 = Indium tin oxide conductor
Substrate = Glass

Figure 48

Concentric Circle Design

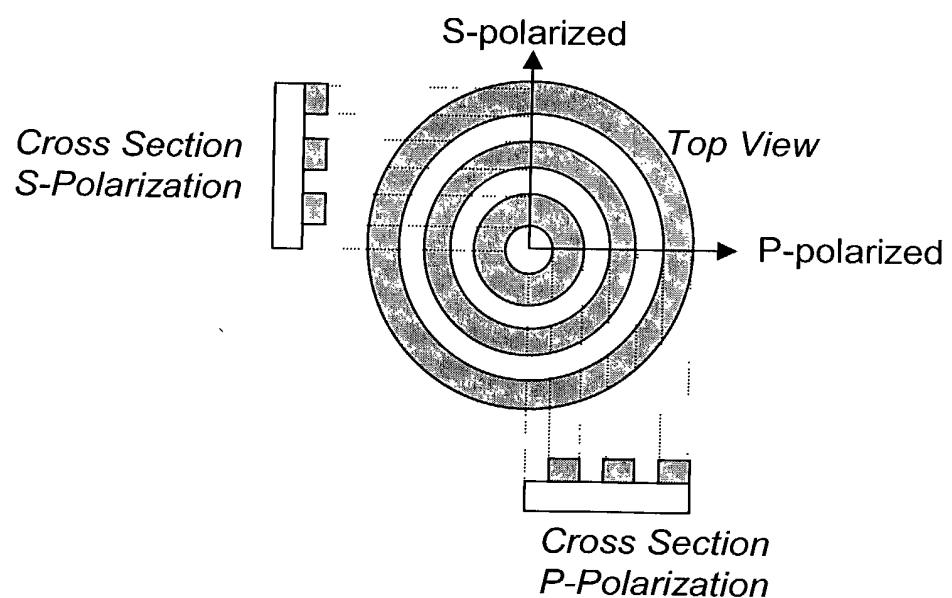


Figure 49

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Hexagonal Grid Design

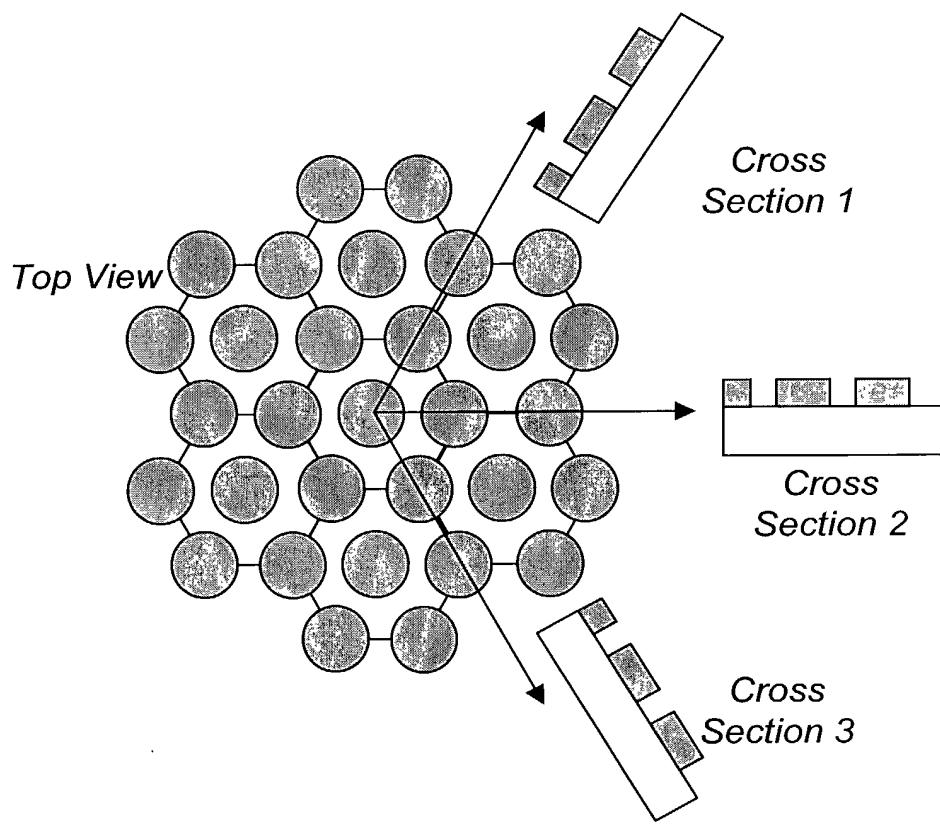


Figure 50



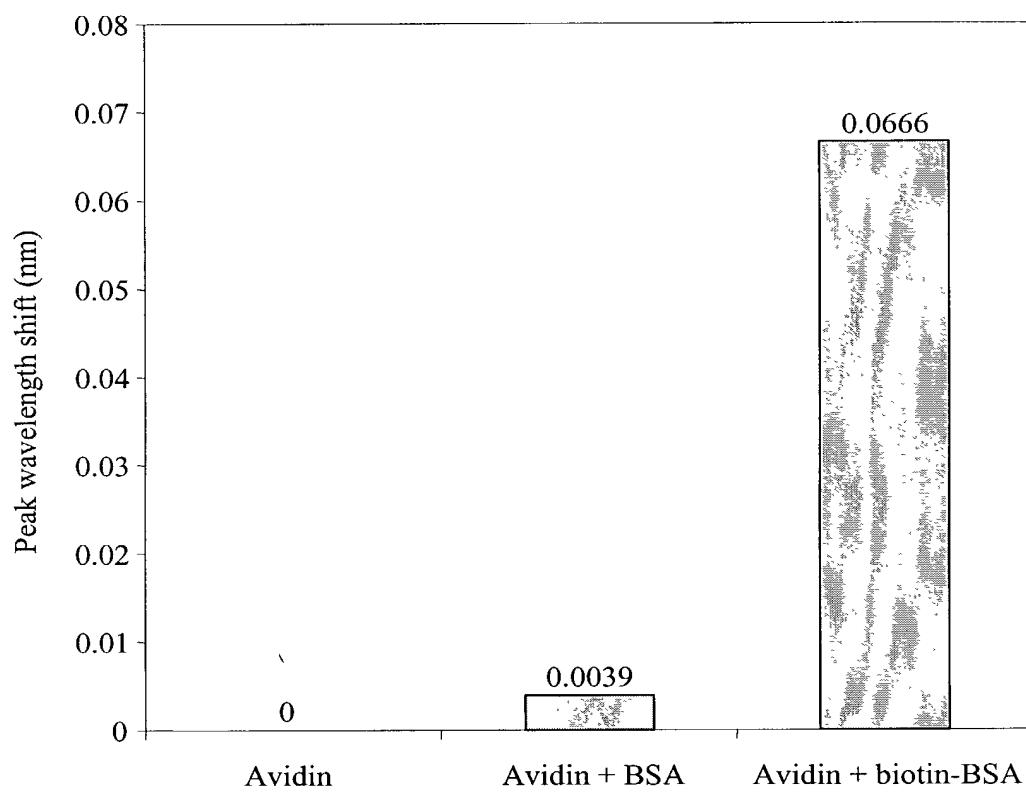


Figure 51

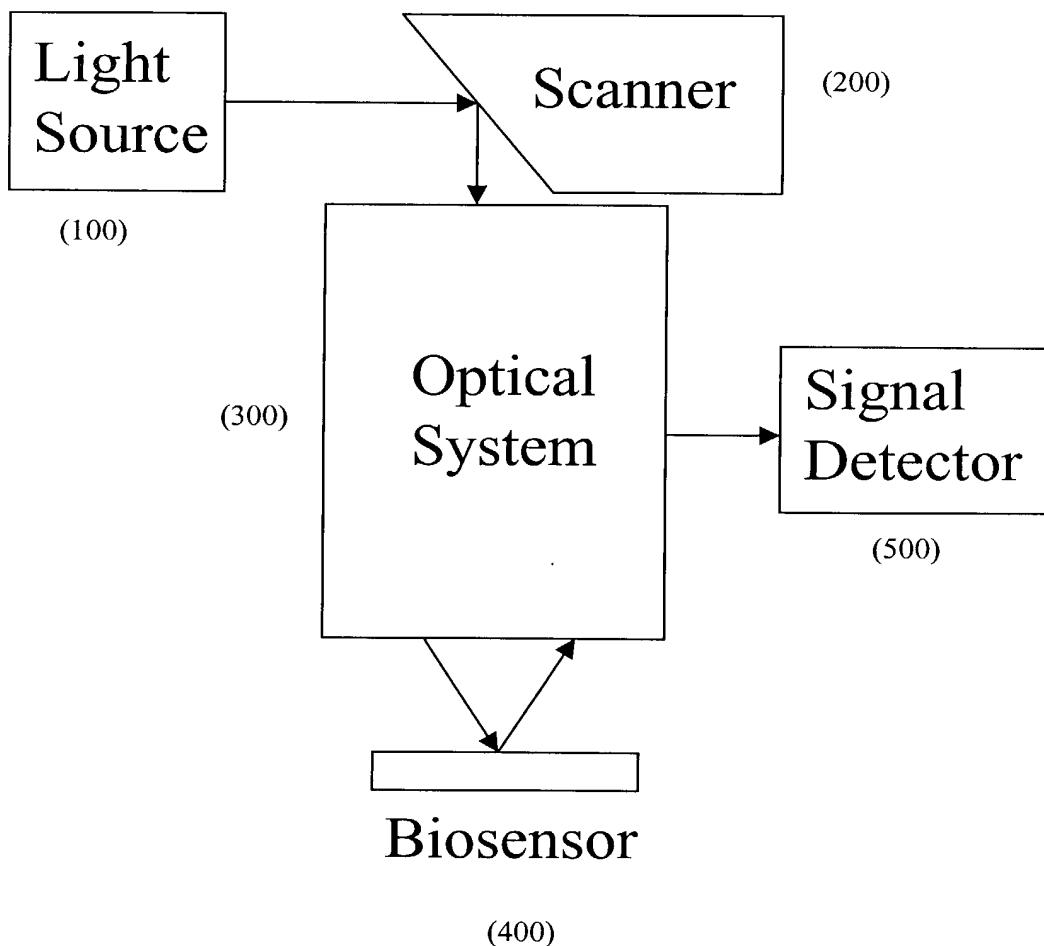


Figure 52